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ORGANIC REMAINS RESTORED.

[Organic Remains Restored]

Before we entirely leave the subject of Organic Remains, in order to give the reader a clearer idea of the animals and vegetables which characterise the lias and oolitic series of the secondary strata (see diagram No. 1, G to M, page 21), we give a representation of the principal species at present known as restored by some of the most eminent geologists. The following is a list of the different objects as indicated by the figures in the wood-cut:—

I.—Plants.

1. 1. Ferns. (*Filices.*)
2. Zamia. (*Cycadæ.*)
3. Arbor Vitæ.
4. Dracæna.
5. Araucaria Pine.
6. 6. Mare's Tail. (*Equisetum.*)

II.—Animals.

7. Dragon Fly.
8. Geometric Tortoise.
9. Megalosaurus.
10. Ichthyosaurus.
11. Plesiosaurus.
12. Ammonitis.
13. Echinus.
14. Nautilus.
15. Cuttle Fish.
16. Encrinitis.
17. Bird-like bats. (*Ornithocephali.*)

MINERAL KINGDOM.—Section 15.

Coal.

Among the many mineral treasures which the soil of the United Kingdom contains, coal is unquestionably the most valuable. It is the chief source of our wealth and power as the foundation of our manufacturing industry; and without such an abundant supply of fuel, our iron, lead, tin, and copper ores must have remained in their native beds. It claims, therefore, the first place in the accounts we propose to lay before our readers of the mineral substances which enter into the business of common life; and we shall now proceed to describe its composition, the manner in which it exists in the bowels of the earth, its probable origin, the different situations in which it is found, and the methods employed to obtain it.

Composition.—Coal is a compound substance, consisting of charcoal, bitumen, or mineral pitch, and earthy matter. Its various qualities depend on the manner in which these ingredients are combined, a large quantity of bitumen producing the fat caking qualities common in the Newcastle mines; and, when it is in small proportion, that dull variety which burns almost without flame;—if there be much earth, the quantity of ashes is proportionably increased. The specific gravity of coal compared with that of water is, on an average, as 1,250 to 1,000,—that is, if a given bulk of water weighs 1,000 grains, a piece of coal of precisely the same bulk would weigh 1,250. When we say that coal is a combination of charcoal and bitumen, we employ rather the terms of a popular explanation of its composition than the strict language of chemical analysis; for that resolves it into a greater number of elementary substances, all of which are gases, with the exception of the carbon. Carbon, the chemical name for charcoal in a state of purity, constitutes the chief ingredient of all coals, amounting to from sixty to seventy per cent.; it is a simple elementary body: but bitumen, the other chief ingredient, is a compound substance, for it yields a large quantity of hydrogen gas, or inflammable air; and oxygen gas, that which constitutes the pure part of the air of the atmosphere and sustains life, has also been found in considerable quantity in coal. When coal is strongly heated in a close iron vessel, the hydrogen gas is given out in combination with carbon, forming the gas used for lighting; and those coals which contain the most bitumen yield the largest quantity of gas. The flame of coal, in a common fire, is occasioned by a sort of distillation of the coal which is slowly going on; gas is given out in the process, and is set fire to. We often see the Newcastle coal, in our grates, swelling up like a soap-bubble, which is occasioned by the disengagement of gas in the midst of the softened bituminous coal; and when we hear a rushing sound issuing from the coals accompanied with smoke, if we bring a bit of lighted paper to the smoke, it catches fire on account of the large admixture of gas. The gas from coal may be exhibited in a very simple way, by putting some pounded coal into the bowl of a tobacco-pipe, closing it up well with clay, and placing it in a strong common fire; smoke will soon issue from the pipe, and, if a lighted candle be applied, it will catch fire and continue to flame for some time: what remains in the bowl is coke or charcoal.

The coals used in this country for fuel may be divided into three different kinds: 1. The stone-coal, or splent-coal, as it is sometimes called from its splintery fracture, has the least proportion of bitumen, and, by being intermixed with much earthy matter, yields a large quantity of ashes. There is no precise name for this kind of coal, neither among miners nor geologists, and there is consequently much confusion in descriptions of different coal-mines; what we speak of now is the prevailing quality in the Staffordshire and Scotch coal-fields;—2, the caking-coal, which is the prevalent quality in the Northumberland and Durham mines,—that used in London;—and, 3, a variety called cannel-coal in England and parrot-coal in Scotland, which has a very close compact texture, is hard and splintery, crackles in the fire, and burns with a very bright flame: it is found, however, in comparatively small quantities. These different kinds are sometimes all met with in the same mine; and there are many varieties in different places partaking more or less of the character of one of the three.

Geological Situation.—All the above-mentioned qualities of coals are found under the surface of the ground, associated with beds of sandstone of different textures, of a hard slaty clay called shale, presenting also great differences of composition, colour, and hardness, and occasionally with beds of limestone. These associated beds, or strata, of coal, sandstones, clays, shales and limestones, are usually called the coal measures by practical miners, and a tract of country containing the mines, a coal-field; both terms are very convenient and have been adopted by the geologists of this country. There is no determinate order in which these strata occur in different coal-fields, but in different parts of the same coal-field they generally preserve a regular succession. Coal-fields are usually separated from each other by extensive tracts of country, composed of rocks in which no coal exists, and they vary in magnitude from a few acres to many square miles. The measures in the same field sometimes consist of a hundred alternations of beds, all of very different degrees of thickness, from less than an inch to many feet; and this difference applies equally to the beds or seams of coal as to the rest, but the proportion of coal to the interstratified stones is always much inferior.

The rocks which are comprehended in what, as a whole, may be called the coal formation, are, beginning with the lowest:—

1. The old red sandstone. (P*.) When this is present it forms the foundation of the whole, and when not present, the coal-measures rest, of course, on the older strata which lie beneath that sandstone.
2. A limestone, called by English geologists the mountain limestone, and also, which is much better, the carboniferous limestone,—that is, the *coal-bearing.* (O.)
3. Beds of coarse sandstone, composed of sand and flinty pebbles, sometimes fine-grained, but more generally very coarse, called the millstone grit,

* The letters refer to the diagram in No. 51, 19th of January, 1833.

(N.,) grit being a provincial name for sandstone, and millstones being got from some parts of it.

4. The coal measures. (M.)

In the north-eastern, midland, and southern coal-fields of England this is the usual order, the coal being all above the millstone grit; but in the north-west of England the beds of coal are interstratified both with the millstone grit and with the carboniferous limestone.

Thin seams of coal, and even sometimes so thick as to be worth working, are occasionally found in some of the superior deposits of the secondary strata; but all the great coal-measures belong to the lowest part of the secondary series. (See Diagram in No. 51.) Coal, such as we are now describing, has never been found in or below the old red sandstone, P, and never in or above the magnesian limestone, L, or rather a red sandstone which lies immediately beneath that limestone. No searches for coal, therefore, in the great series of strata which lie above the coal-measures, (see Diagram in No. 51,) or in the old red sandstone and the strata beneath, can ever turn to good account, and in ninety-nine cases out of a hundred would be fruitless. Vast sums of money have been again and again thrown away in such attempts; and it is much to be regretted that many of those persons who, in this country, follow the profession of what is called a mineral surveyor are extremely deficient in the scientific knowledge requisite for the right understanding of their business. Men of property too often suffer themselves to be led into mining undertakings of vast expense by ignorant pretenders; and are often subjected in consequence to enormous losses which an application to a scientific geologist might have saved them from. In France and Germany this can rarely or ever happen, because the mining engineers of those countries are regularly trained to their business by a preliminary scientific education. Nothing can be more absurd than that, in a country so abounding in mineral treasures, and depending so much as Great Britain does for her national prosperity upon her mines, there should not exist a single institution, either in our universities or elsewhere, in which a young man desirous of educating himself thoroughly as an engineer of mines can obtain the necessary instruction. It would be an immense advantage to individual proprietors of mines, and would be an equally great national benefit, if a school of mines were established, where the different branches of science connected with the whole subject should be taught, with the means, at the same time, of giving that practical knowledge without which the most complete scientific education would be of little avail. But to make such a school really useful, it would be necessary that it should be a chartered establishment, possessing the power of conferring a professional title upon its pupils, after strict examination and ample proofs of competency. Bristol would be, perhaps, upon the whole, the best place for such a school, because it is itself in a mining country, is in the immediate neighbourhood of the great coal and iron districts of the south of Wales, and not very far from Cornwall; and its neighbourhood is admirably suited for elementary field-instruction in geology.

[We shall continue the subject of the geological situation of coal in our next Section.]

THE VINTAGE.

(*Abridged from Redding's 'History and Description of Modern Wines.*)

The vintage is the next important operation connected with the vine after the cares of the dresser are over. Not only do the opinions of individuals in wine countries differ very widely upon the management of the vintage, but in some the period of the gathering is regulated by authority, as if the vine-grower was not the best judge of the state of his produce, and did not know when his property was in the best order for yielding him a profitable return. The signs which usually regulate it are observed in the south of Europe about the end of September, or commencement of October. In the north, the fear of autumnal frosts, which injure the unripe grape, makes the seizure of the exact moment proper for the vintage a matter of great importance.

The time of the vintage being fixed, it is begun as early in the day as possible after the sun has dissipated the dew. The red grape is generally ripe before the white. In the north, they are not so particular respecting the dryness of the fruit when gathered as in the south; in fact, it is often gathered, in the north of France, with the dew upon it. The gathering is uniformly continued with as much rapidity as possible, if the weather continue fair, so as to terminate the pressing in one day. If this cannot be done, the vintage is suspended, for the fermentation in a warm, or even a moderate temperature, is far more energetic than in cold, damp weather. It ruins the durability of the wine if the fruit is gathered and fermented at such a time.

The fruit in some countries is cut off the plant with a knife; in France, the scissors is used, by which the stems of the branches are rapidly severed. In ruder countries, the hand only is applied, a mode injurious to the grape as well as to the vine. The most approved plan is to make three separate gatherings of the fruit. The *first* includes all the finest and ripest bunches. The green, rotten grapes, or such as have been eaten into by insects, are cleared from the bunches, which are then carefully carried home. The *second* gathering implies naturally a second pressing. The grapes are not quite as ripe as the first. The *last* gathering and pressing consists of the inferior grapes. The gathered bunches are deposited as lightly as possible to prevent the grapes from being bruised. All dry or spoiled grapes are cast aside, where proper care is used, as fine or delicate wine is intended to be made. Each labourer places his gathering in an ozier basket, or in a sort of wooden dosser, carried with the least possible motion. In France, in the department of the Marne, the grapes are carried on horseback covered with cloths. The grapes in some countries are plucked from the bunches; in others, they are placed entire in the press, stems and all. The best grapes only are used for making the better kinds of wine. The astringent principle lodged in the stems is thought to be beneficial, and to impart to the wine a capacity of endurance or long keeping. When picked, it is only for red wine, and is generally done by the hand. White-wine grapes are rarely picked from the clusters.

Grapes were anciently trodden out, after being exposed, on a level floor, to the action of the solar rays for ten days; they were then placed in the shade for five days more, in order to mature the saccharine matter. This practice is still followed in some of the islands of the Greek Archipelago, at St. Lucar in Spain, in Italy, at least in Calabria, and in some of the north-eastern departments of France. The fermentation is facilitated greatly by this process. In some parts of France, a labourer with sabots treads the grapes out as they come from the vineyard in a square box, having holes in the bottom, and placed over a vat,—a very barbarous method. The murk is then removed, and he proceeds with fresh grapes till the vat is full. Sometimes they are squeezed out in troughs, by naked men, using both sabots and hands at once.

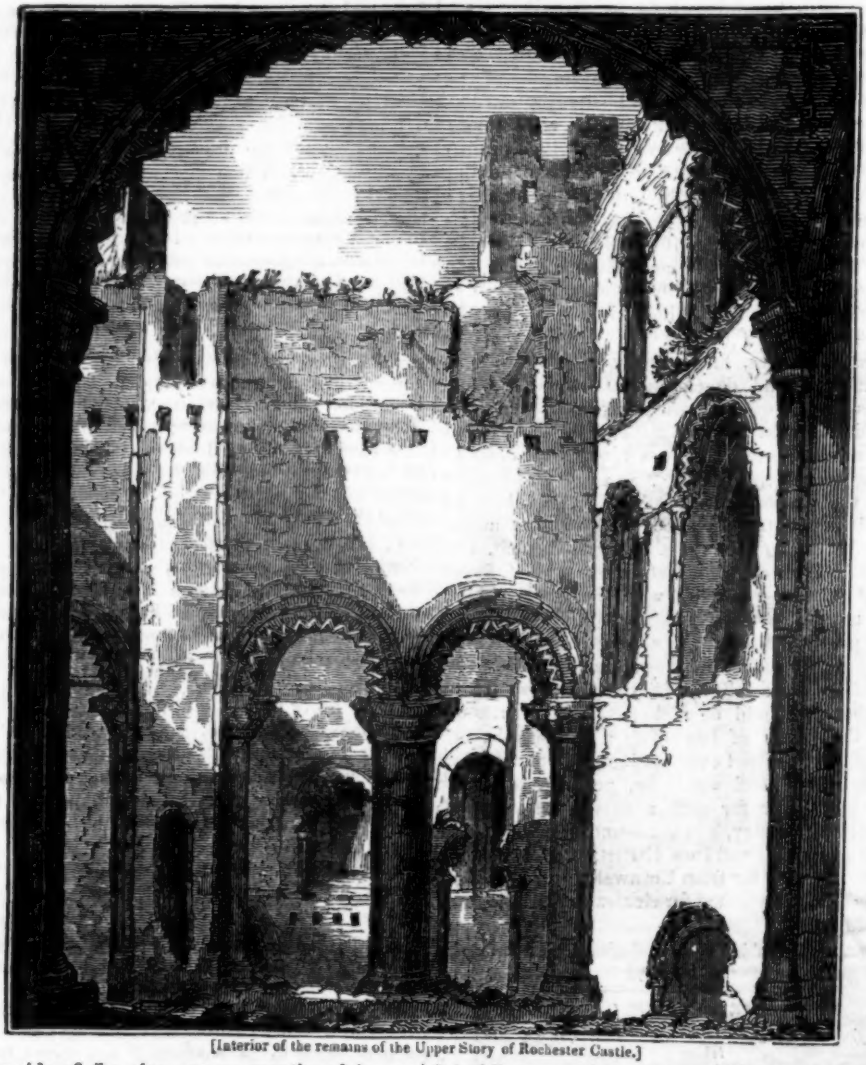
The wine-press differs in construction in different countries. There are several kinds. For red wine, the grapes are trodden before they are pressed, in order to disengage the colouring matter from the skins; but in making white wine, this operation is never performed. In either case, where the press is applied, the first pressing is dispatched as quickly as possible.

At first the press is used gently, that the wine may not overflow. The pressure is then gradually increased, until the murk becomes moderately compressed. This is the first pressing. The grapes that did not sustain pressure, being scattered over the edges of the heap, are now gathered up, the press relaxed, and being placed upon the murk, the press is tightened again. The wine from this is called of the second pressing. The edges of the whole mass are now squared down with a cutting instrument, so that the mass of fruit is reduced to the form of an immense oblong cake, upon which the cuttings of the edges are heaped, and the press worked again, which makes wine of the third pressing, or, as the wine-maker calls it, *wine of the first cutting*. The pressing and cutting are repeated two or three times, and what liquid flows after is called among the labourers wine of the second or third cuttings.

The great wine-press is capable of making no less than twenty-five pieces of wine in four hours. Where vineyards are extensive, as it is desirable to press the produce of the gathering in one day, however large in quantity, this press is useful; but it is the instrument of making a large quantity of secondary wine, rather than a little of a choice character, and is used principally by the larger vine-growers. There is only one species of wine which is made without beating, treading, or pressing, this is what they call in Spain *lagrima*. The grapes, melting with ripeness, are suspended in bunches, and the wine is the produce of the droppings. This can only be effected with the *muscatel* grape of the warm south. In this way the richest Malaga is made. In Cyprus the grapes are beaten with mallets, on an inclined plane, with a reservoir at the end.

Mr. Redding enters into some statements concerning various uses of the vine which are not in England commonly known, and which we are obliged by our limits greatly to condense. The must of the south is employed in making a rich confection with citrons and aromatic sweets. On the residue of the grapes, the refuse of the vintage, together with the murk, hot water and syrup are thrown, and the product is a very small wine, cooling and pleasant to the taste. One hundred and ninety-five pints of murk, burned, furnish five and a quarter of potash. The murk, beaten in water and distilled, produces brandy of a secondary quality. Vinegar is also extracted from the murk, which is first acidified. Verdigris is made from the murk by placing plates of copper and murk alternately in a vessel to which the plates fit in diameter. The whole is wetted from time to time with acid wine. When the oxidation is complete, the verdigris is taken out and put into packages for sale. The murk is eagerly sought after by all the herbivorous animals for nourishment. It is either given dry or mingled with other fodder. Fowls are remarkably fond of it. The murk is also one of the best dressings for the vineyard of any known, especially if mingled with dove or pigeon's dung. The murk is often dried from the press, and burned where fuel is scarce, being laid up for winter use, and dried, as tan is treated in some parts of England. Even the pips or seeds of the grape are applicable to useful purposes: pigeons delight in them; and the Italians extract from them an oil much superior to that from nuts, either for eating or burning.

ROCHESTER CASTLE.



[Interior of the remains of the Upper Story of Rochester Castle.]

Close by the side of the river, as we mentioned in our account of the 'City of Rochester' in our 94th Number, and immediately above the bridge, stands Rochester Castle; still, though now a bleak and roofless ruin, retaining many unobliterated features of its ancient vastness and magnificence. Its site is considerably elevated above the general level of the city; and, dilapidated as its walls are, they still tower far above all the other buildings in their neighbourhood, the pinnacles of the cathedral only excepted *. The principal part of the castle may, indeed, it is said, be seen from a distance of twenty miles.

* In our 97th Number the tower of the Cathedral was by mistake spoken of as surmounted by a spire. The spire was blown

The fancy of our old chroniclers and legendary writers, which has adorned so many of our cities and buildings with a fabulous antiquity, has not forgotten the Castle of Rochester. In reference to the stories which have been invented with the view of giving it as illustrious an origin as possible, we may adopt the sensible language of the antiquary William Lambarde, who, in his 'Perambulation of Kent,' (written in 1570,) says:—"Some men (desirous belike to advance the estimation of this city) have left us a far-fetched antiquity concerning one piece of the same, affirming that Julius Cæsar caused the Castle at Rochester (as also that other at Canterbury, and the Tower at London) to be builded of common charge: but I, having not hitherto read any such thing, either in Cæsar's own Commentaries, or in any other credible history, dare not avow any other beginning of this city or castle than that which I find in Beda."

Bede's account is, that Rochester took its name from one Rof or Rhof, who was once lord of it; but we have already shown that there is, in all probability, no foundation for this etymology. As Rochester, however, was a military station in the latter times of the Roman empire in Britain, there is reason to believe that a fort occupied the site of the present castle, the position of which is exactly such as would have recommended it for such an erection. Many Roman coins have been found within the circuit of the castle, but none in any other part of the city; from which we may conclude that this was the only part of the city which existed in the time of the Romans. This supposition is still further confirmed by the language of documents of the Saxon period, which speak of the place as still merely a castle. Indeed the name Rochester, as already explained in our former notice, is an evidence that the station was originally merely a chester, castrum, or camp, and that the town has gradually grown up around the military fort.

[Gateway of Rochester Castle.]

If the Saxons had a castle here, which is by no means proved by the place having been called by them Castrum or Castellum, certainly no part of any such building now remains. The oldest portion of the present ruin is in the early Norman style of architecture. The building was probably the work of the Conqueror,—one of the many strongholds which he erected in all parts of the country to maintain his foreign dominion. Here it appears that his illegitimate brother, the famous Odo, Bishop of Bayeux and Earl of Kent, resided, and kept his court as a sort of petty sovereign of the county. After the death of the Conqueror, Odo, who espoused the cause of his eldest son Robert, shut himself up in this castle, and being joined by many of the nobility, for some time resisted the arms of Rufus. The rebels were, however, at length reduced. In the latter part of this, or the commencement of the following reign, the vast and lofty tower which now forms the principal part of the ruin, is said to have been built by the famous Bishop Gundulph. But if the bishop's whole expenditure, as is asserted, was only "three score pounds," comparatively cheap as labour and materials then were, he could not with that sum have advanced such a building very far. It is not improbable, therefore, that the tower was completed, and indeed principally constructed, at the expense of the Archbishop of Canterbury, to whom the castle was granted by Henry I., and by whom it is known that extensive repairs and improvements were executed upon the fabric. "By means of which cost done upon it at that time," says Lambarde, "the Castle of Rochester was much in the eye of such as were the authors of troubles following within the realm, so that from time to time it had a part almost in every tragedy."

In the reign of John, Rochester Castle was taken possession of, first in 1215, by the insurgent barons, who were, however, after some time, obliged to surrender to the king's forces, and, in the following year, by the Dauphin of France, whom they had called over to their assistance. In the time of the next king, Henry III. its strength was again attempted to be turned against the crown, having, in 1264, immediately after the battle of Lewes, been attacked by the victorious Montfort, Ear. of Leicester. This celebrated person, Lambarde tells us, "girded the city of Rochester about with a mighty siege, and setting on fire the wooden bridge, and a tower of timber that stood thereon, won the first gate or ward of the castle by assault, and spoiled the church and abbey; but being manfully resisted seven days together by Earl Warren that was within, and hearing suddenly of the king's coming thitherward, he prepared to meet him in person, and left others to continue the siege, all which were soon after put to flight by the king's army."

The last repair of the building that is recorded to have taken place was in 1461, in the reign of Edward IV. Since then it appears to have been almost entirely neglected, and has been allowed gradually to fall into the ruinous state in which it now appears, though not without the waste of time having been assisted by active dilapidation. The ruin, which is now the property of the Earl of Jersey, occupies a quadrangular space of about three hundred feet in each dimension. The north, south, and east sides had been formerly defended by a deep ditch; but that is now filled up. The river flows on the west side. The walls are, for the most part, built of rough stones from Caen, bound together by a cement which has now become extremely hard. Their thickness varies from eleven to thirteen feet. Fragments of several towers still remain at the angles, and in other parts of the building; but of these there is no other to be compared in magnitude to that called Gundulph's Tower, which has been already mentioned, and which stands at the south-east angle of the castle. This is a quadrangular erection, each side of which, at the base, is not less than seventy feet long, while the height of the whole is a hundred and twelve feet. The walls incline slightly inwards as they rise from the ground. Attached to the east angle is a smaller

down some years ago, and its place has been supplied by four tall pinnacles rising from the angles of the tower, as may be seen in the view of the city given in the Magazine, No. 94.

tower, between seventy and eighty feet in height, which is to be considered as part of the same erection. These two towers appear to have contained the principal apartments of the castle, and they have evidently been laid out so as to afford accommodations of princely magnificence. A partition wall, of five feet in thickness, runs up the middle of the larger tower, from the ground to the roof; and the height has been divided into four successive stories by three floors, the marks of which on the walls are still perfectly discernible, although the joists and boards of which they consisted have long been removed. They were used, it is said, in building a brew-house on the neighbouring common. Each of the six rooms measures, in the interior, forty-six feet in length by twenty-one in breadth. The height of those on the ground floor is thirteen, that of those in the second story twenty, that of those in the third story thirty-two, and that of those in the fourth story sixteen feet. Winding-stairs of about five feet and a half in width, now much decayed, occupy the east and west angles, and open into every apartment. There are also communications on each floor between the two parts of the tower, by arched door-ways formed in the partition wall. In the third story, where the state apartments appear to have been, these arches, which are four in number, are richly ornamented, and are eighteen feet in height, each of the three columns which divide them being four feet in diameter. Through this central partition, also, a well, two feet nine inches in diameter, ascends to the summit of the building, communicating with each floor as it passes up. The rooms have all fire-places; but there are no chimneys, the vent for the smoke being merely a hole formed in the outer wall immediately above the fire-place. Other larger openings serve for the admission of light and air. The roof of the highest rooms is ninety-three feet in height from the ground, and beyond that there is an uncovered battlement rising seven feet higher. Finally, the towers at the four corners ascend to the height of twelve feet above the termination of the battlement.

OLD TRAVELLERS.—WILLIAM DAMPIER.—

No. 1.

This extraordinary man, whose whole life seems almost to have been spent in distant wanderings and adventures, was born in the year 1652, in the county of Somersetshire. Little is known of his early circumstances, but his family appears to have been respectable, and to have afforded him the means of a common day-school education, though nothing more. His father, however, dying when he was young, William, having given a decided preference to that calling, went to sea, as apprentice to the captain of a Newfoundland trader. His first voyage was to France, and his second to Newfoundland, where the intense cold sickened him of the particular trade in which he was then engaged. Returning to England, and being more than ever anxious to see the world, he determined to try a warmer climate, and accordingly embarked in an East Indiaman as a common sailor. In this capacity, and when he was little more than seventeen years of age, he made a voyage to Bantam.

We next hear of him in the king's service, and as a man already distinguished as an able mariner. In the Dutch war he served under Sir Edward Sprague as a man before the mast, and was present in two engagements.

He was then obliged by ill health to pass a few months quietly ashore. He lived, during this time of brief repose, with a brother, who seems, like the father in that beautiful truth-like fiction—'Robinson Crusoe,'—to have opposed the wandering inclinations of the sailor, and with want of similar success. As soon as the state of his health permitted, he went out to Jamaica; his honesty, activity, and talent, having recommended him to a planter, who was happy to engage him as under-manager of one of his estates. This employment, though sufficiently lucrative, was much too fixed and uniform for Dampier's disposition; he says, he soon found he was "completely out of *his* element:" accordingly he quitted it, and again turning to his favourite element, the sea, he embarked for Port Royal, where he engaged "with one Mr. Fishook, who traded to the north side of the island of Jamaica, and sometimes round it." In this service he attentively studied, and made himself acquainted "with all the ports and bays about Jamaica, and with all their manufactures; as also with the benefit of the land and sea-winds." Such application to the more important parts of his profession is as rare as it is laudable in a common sailor not twenty-three years of age.

In six or seven months he grew tired also of this confined, coasting navigation, and shipped himself "aboard one Captain Hudsel, who was bound to the bay of Campeachy to load log-wood." This voyage was beset with dangers in an extraordinary degree:—the vessel, on her return, was nearly taken by some Spanish cruizers, who, acting in the barbarous spirit of those times, would have made Dampier and all on board slaves; soon after she struck on a sand-bank, where she was well nigh lost; and towards the end of the voyage her provisions ran so short that there was risk of starvation. At length, however, they reached Port Royal, "and so," says our adventurous seaman, who never makes much of his dangers, "ended this troublesome voyage." During its prosecution he obtained new and important nautical information concerning the Alcrane reef, the Colorado shoals, the grand Caymanes, and other dangerous places then very imperfectly known. He says himself that "in all these rambles we got as much experience as if we had been sent out on a design," *i.e.*, on a voyage of survey. But Dampier seems to have been the only person of the company capable of making proper observations and notes of all he saw and learned, and preserving them for the future guidance of seamen.

In Campeachy Bay he had seen, among the log-wood cutters, a scene of independence—an adventurous mode of life,—a field for enterprise, with "a great prospect of getting money, if men would be but diligent and frugal," that perfectly suited his ardent disposition. Almost as soon, therefore, as he was "paid off" from his last ship, he purchased hatchets, axes, long knives, saws, wedges, a moschito tent to sleep in, a gun, a supply of powder and shot, with other things proper for the new kind of life he contemplated, and sailed again for Campeachy. Reaching that place in safety, he settled among two hundred and sixty or two hundred and seventy logwood men, who were chiefly English, who had all been buccaneers, and who were then living at large, with no laws but their own will or caprice,—in a sort of republic which, in several respects, would have exactly suited Trinculo, the drunken boatswain in Shakspeare's 'Tempest.' Their manner of living, which was certainly not without its hardships, is admirably described by Dampier. Their abodes were log-huts covered with palmeto leaves to defend them from the violent and soaking rains; they were erected close by creeks or inlets, for the benefit of the sea breezes during the oppressive heats, and as near to the logwood groves as possible, that they might not have to carry the heavy material far. As they exhausted the trees, they removed their huts to another grove. Their bedding was a wooden frame raised three feet and a half above the ground,—four stakes or poles, rising above this frame, supported a light tent, "out of which here is no sleeping for moschitoes." Another frame covered with earth served as a cooking-place, and for stools and chairs they used logs. "During the wet season," says Dampier, "the land where the logwood grows is so overflowed that they step

from their beds into the water, perhaps two feet deep, and continue standing in the wet all day, till they go to bed again; but nevertheless account it the best season in the year for doing a good day's labour in."

For food they hunted the wild cattle, with which, and with alligators, the savannahs of the country swarmed. "When they have killed a beef," says Dampier, "they cut it into four quarters, and, taking out the bones, each man makes a hole in the middle of his quarter, just big enough for his head to go through, then puts it on like a frock and trudgeth home; and if he chances to tire, he cuts off some of it and flings it away."

For flour, bread, and most other luxuries, they depended on the ships that visited them to purchase their logwood. The arrival of one of these vessels was a signal for the commencement of a scene of almost general riot and debauchery; and in a few days these uneducated, imprudent men would spend the earnings of months of hard labour in a dreadful and dangerous climate, where, moreover, they were constantly liable to be surprised by the Spaniards, who, with some reason, denied the legality of their settlement, and who treated them as pirates, and made slaves of those they took.

From the high prices logwood then commanded, there was indeed, as Dampier observed, "a great prospect of getting money." Comparatively handsome fortunes might have been made in a short time by industry and thrift, but these virtues could scarcely exist in a society of buccaneers, who, so far from having relinquished their old habits, still made incursions "among the nearest Indian towns, which they plundered, and brought away the Indian women to their huts, and sent their husbands to be sold at Jamaica." It was the immoderate use of the rum of that island that confirmed their vices, drained their purses as fast as robbery or labour could fill them, and kept these ignorant sailors constantly poor and desperate. Dampier, who frequently laments these vices, which, however, he must have been prepared to expect, says, in his quaint way, "Besides, they had not their old drinking bouts forgot, and would still spend £30 or £40 at a sitting, aboard the ships that came hither from Jamaica, carousing and firing off guns for three or four days together. And though afterwards many sober men came into the bay to cut wood, yet, by degrees, the old standers so debauched them that they could never settle under any civil government."

How our traveller should have stayed, as he did, for nearly three years among such men, and have escaped the moral contagion, is truly astonishing. During this residence he diligently collected the most valuable information concerning the natural history of those parts of the western world, the winds, currents, coasts, and about all subjects of importance to the nautical profession. All this Dampier performed while working as a common logwood cutter in the Bay of Campeachy.

Instead of spending his money in rum, like the rest, he saved it, and, at the end of his labours, returned to Jamaica in 1678, and thence to England, with capital sufficient to start him again in an advantageous manner. His old comrades at Campeachy, some time after his departure, met a tragical fate: the Spaniards, seeing their careless way of living, fitted out an expedition which surprised them in their huts, and either butchered them or made them prisoners. The prisoners were sent up the country and sold as slaves.

Our traveller arrived at London in the beginning of August, 1678, and at the beginning of the following year, he says, he set out again for Jamaica, "in order to have gone thence to Campeachy; but it proved to be a voyage round the world."

He invested the money he had made as a logwood cutter in English merchandise, which he sold at Jamaica, where he intended "to stock himself with rum and sugar, saws, axes, hats, stockings and shoes, and such other commodities as would sell among the Campeachy logwood-cutters;" for his past experience did not deter him from revisiting that wild place. Circumstances, however, occurred which changed his plans, and he remained all that year at Jamaica in expectation of some other business in which to employ his capital. While there, he happened to hear that a person residing on the island had "a small estate" for sale; and as it was in Dorsetshire, "near his native county of Somerset," (it is interesting to observe these local attachments in such a man) Dampier bought it. He says, "I was just embarking myself for England, about Christmas, 1679, when one Mr. Hobby invited me to go first a short trading voyage to the country of the Moschitoes*. I was willing to get up some money before my return, having laid out what I had; so I sent the writing of my new purchase along with the same friends I should have accompanied to England, and went on board Mr. Hobby."

At this time the buccaneers, whom Dampier calls "privateers," had again mustered in great force, and it was our traveller's fortune to fall in with them, at the western extremity of Jamaica. Seduced by the splendid prospects presented to them by the marauders, every man on board Hobby's ship, except himself and Dampier, went and joined them; "and being thus left alone," says our adventurer with admirable coolness, "after three or four days' stay with Mr. Hobby, I was the more easily persuaded to go too."

It must excite our reader's surprise to see how readily a man of a decent character and of an enlightened mind joins an association which we fear, after all, we must denominate piratical. A short account of those bodies, and of the notions of right and wrong prevalent at the time, will somewhat diminish this astonishment, and is necessary to make out Dampier's curious history.

The Spaniards, who were the discoverers of America and the first European settlers in the West Indies, were actuated by a most jealous and illiberal spirit, astonishing even at that period, when the true nature of commercial intercourse was not understood, and when even the simplest rules of political economy were generally unknown.

Spain, indeed, considered the New World as treasure-trove, of which she was lawfully and exclusively the mistress. A bull of the Roman Church, granted by Pope Alexander VI., gave what was then esteemed as a sacred recognition of these exclusive rights, and the government of Spain determined, that none but Spaniards should trade with, or land upon, the American continent and islands. Such folly must now appear unaccountable; but it is an historical fact, that the Spaniards at first fancied they could keep their discoveries in the West Indies a secret from the rest of the world, and prevent the ships of other nations from finding their way thither. Not all the power of Spain, comparatively great as it then was, nor all the cruelty exercised in support of her extravagant pretensions, could deter the enterprising mariners of France and England from attempting to share in the greatly-exaggerated wealth of the New World. As early as 1526, one Thomas Tyson was sent to the West Indies as factor for some English merchants, and many adventurers soon followed him. The French began to increase in that part of the world about the same time. All these men went with the certainty of meeting with hostility from the Spaniards, and with the determination of returning it with hostility. To repress these intruders the Spaniards employed armed ships, or guarda-costas, the commanders of which were instructed to take no prisoners! On the other hand, the English and French, to whom were soon joined many Dutchmen and some Portuguese, closely combined among themselves, treated every Spanish ship as an enemy, made descents on the coasts, ravaging the towns and settle-

* The Moschito Indians lived on the Isthmus of Darien.

ments of the Spaniards, and repaid cruelty with cruelty. A continual warfare was thus established between Europeans in the West Indies, entirely independent of the governments of their respective countries. All Europeans, not Spaniards, whether there was peace or war between their nations in the Old World, on their meeting in the New, regarded each other as friends and allies; they styled themselves "Brethren of the Coast," and held the Spaniards as their common foe.

When not engaged in predatory expeditions, the principal occupation of these men was hunting wild cattle; but this they did not begin to do till some years after their first appearance in the West Indies: at a still later period many of them became logwood-cutters in the Bay of Campeachy, as we have already shown. As hunters, they could turn the hides, suet, and dried meat of the wild beeves to good account; as wood-cutters their calling was yet more profitable; and had the Spaniards permitted them to follow these occupations in peace, it is reasonable to suppose that they would gradually have settled into inoffensive members of society, or, at least, that they never would have formed such numerous and desperate bands as they did eventually. But the Spaniards regarded every rood of land as their own, and, in their unwise jealousy, would not permit any other people to derive advantage even from those vast tracts of country which they themselves had no population to occupy, and which, in many instances, they had scarcely seen, until, attracted by the news that Europeans had settled in them, they went to burn, destroy, and murder.

When the court of Spain made formal complaints to the different governments of Europe, of which the adventurers in the West Indies were the natural subjects, the general answer received was, "that the men, against whom they complained, acted entirely on their own authority and responsibility, not as the subjects of any prince, and that the King of Spain was at liberty to proceed against them according to his pleasure." Far different, however, was the reply of our high-minded Queen Elizabeth. She said boldly, "that the Spaniards had drawn these inconveniences upon themselves by their severe and unjust dealings in their American commerce; for she did not understand why either her subjects, or those of any other European prince, should be debarred from traffic in the West Indies. That as she did not acknowledge the Spaniards to have any title by the donation of the Bishop of Rome, so she knew no right they had to any places other than those they were in actual possession of; for, that their having touched only here and there upon a coast, and given names to a few rivers or capes, were such insignificant things as could no ways entitle to a proprietry further than in the parts where they actually settled and continued to inhabit*."

This remonstrance had no effect on the Spaniards, who continued to treat the adventurers not of their nation as lawless intruders, and to torture and exterminate them whenever they had an opportunity. Such cruelties were much circulated, and probably much exaggerated in Europe, in the form of popular stories, and produced a great effect. One Montbars, a Frenchman, on reading a narrative of this kind conceived such a deadly hatred against the Spaniards, that he went to the West Indies, became a buccaneer, and pursued his vengeance with so much success, that he obtained the title of "The Destroyer."

As the arms of the buccaneers were solely directed against the Spaniards, all the other European nations who gradually made regular settlements in those parts, and lived under governors appointed by their several courts, regarded them as champions in the common cause. When any of those nations were at war with Spain, they granted regular commissions to the buccaneers, who then acted as privateers in their country's service. From these and other circumstances the buccaneers obtained great power, and even temporary respect. Many men of respectable lineage and education joined their association; nor were they considered as robbers and sanguinary pirates, until later, and more settled and more moral times. Peter of Dieppe, called "Peter the Great," L'Olonnais, Le Basque, and Mansvelt, were among the most celebrated of the buccaneer captains; but their fame was eclipsed by a Welchman, named Henry Morgan, who, after many successes, about nine years before Dampier's expedition, had crossed the isthmus of Darien to the South Sea, and taken and plundered the rich city of Panama.

All these commanders were detestably cruel, but at the period when Dampier agreed to take part in their adventures, the buccaneers, generally, were much more humanized. The vices of drunkenness and gambling still, however, prevailed among the majority; who, after a life of almost unceasing danger, perished prematurely in battle, by accident, or by disease. A few of them merited and found a better fate,—and these few were men who had cultivated their minds, who were fond of reading, who delighted in examining the wonderful varieties of nature presented to them in the course of their wanderings, and who, in such resources, found sufficient amusement without drinking or playing.

[To be continued.]

* Camden.

Tyranny of Fashion.—The abominable custom of flattening their heads prevails among the Indians of North Western America. Immediately after birth the infant is placed in a kind of oblong cradle, formed like a trough, with moss under it. One end, on which the head reposes, is more elevated than the rest. A padding is then placed on the forehead, with a piece of cedar-bark over it, and by means of cords passed through small holes on each side of the cradle the padding is pressed against the head. It is kept in this manner above a year, and is not, I believe, attended with much pain. The appearance of the infant, however, while in this state of compression, is frightful, and its little black eyes, forced out by the tightness of the bandages, resemble those of a mouse choked in a trap. When released from this inhuman process, the head is perfectly flattened, and the upper part of it seldom exceeds an inch in thickness. It never afterwards recovers its rotundity. They deem this an essential point of beauty, and the most devoted adherent of our first Charles never entertained a stronger aversion to a *Roundhead* than these savages.—*Ross Cox's Adventures on the Columbia River.*

The practices of savages have sometimes a parallel in those of civilization. A quarter of a century ago,—at most half a century,—it was the custom of nurses to bind infants so tightly round the body with swaddling-clothes, that the natural form of the chest was altered. Some young ladies still do the same with stays.

The Affection of a Wolf.—"By way of enlivening the description of the structure of animals, he (M. de Candolle, Lecturer on Natural History at Geneva) introduced many interesting particulars respecting what he called *leur morale*, or their natural dispositions, and the changes they underwent when under the dominion of man. Among other instances of the affection which wolves had sometimes shown to their masters, he mentioned one which took place in the vicinity of Geneva. A lady, Madame M———, had a tame wolf which seemed to have as much attachment to its mistress as a spaniel. She had occasion to leave home for some weeks: the wolf evinced the greatest distress after her departure, and at first refused to take food. During the whole time she was absent, he remained much dejected on her return, as soon as the animal heard her footsteps, he bounded into the room in an extasy of delight; springing up, he placed one paw on each of her shoulders, but the next moment he fell backwards and instantly expired."—*Bakewell's Travels in the Tarentaise*, &c., vol. ii., p. 153.

*** The Office of the Society for the Diffusion of Useful Knowledge is at 59, Lincoln's Inn Fields.

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